

REMARKS

The office action of 02/05/2004, has been reviewed and its contents carefully noted. Reconsideration of this case, as amended, is requested. Claims 1-5, 7-13 remain in this case, claims 6 being cancelled and claims 8-13 being added by this response.

Rejection(s) under 35 U.S.C. §102

Claims 1-3, and 5-6 are rejected under 35 U.S.C. 102(e) as being anticipated by Ogawa (US Patent No. 6,477,996).

The Office Action states, in part:

Ogawa discloses a VCT mechanism (B) for adjusting and maintaining an angular relationship between a camshaft (10) and a crank shaft (connected to 31a) or another shaft (See Fig. 2) using a pressurized fluid (C), the VCT mechanism having a phaser using the pressurized fluid for adjusting and maintaining the angular relationship, the pressurized fluid flows from a fluid source (110) to a fluid sink (120), the VCT mechanism comprising: a locking pin (61; 62) being disposed to engage a recess (21f; 21g), wherein the pressurized fluid is allowed to flow therein, to thereby disengage the locking pin from the recess; a spool valve (100, 104) controlling the flow of the pressurized fluid for adjusting and maintaining the angular relationship, and **an extra land** (104a-104e) disposed to control the timing of the pressurized fluid flowing from the fluid source toward the recess and from the recess toward the fluid sink; and a set of passages (101, 102, 106, 107, 104f, 104g, 104h, 104i, 104j, 104k) disposed to have fluid flowing therein, the set of passages including: a first passage (106) disposed to have fluid flowing therein, the first passage having a first end disposed to be in fluid communication with the fluid source and a second end; a second passage (101) disposed to have fluid flowing therein, the second passage having a first end disposed to be in fluid communication with the second end of the first passage, the second passage further having a second end in fluid communication with the recess, and a third passage (107) disposed to have fluid flowing therein, the third passage having a first end disposed to be in fluid communication with the first end of the second passage, the third passage further having a second end in fluid communication with the fluid sink; wherein the spool valve is disposed to control the fluid communication between the first end of the second passage and the second end of the first passage; wherein the spool valve is disposed to control the fluid communication between the first end of the second passage and the first end of the third passage (See Figs. 5-11); wherein the set of passages are disposed to be in fluid communication with an advance chamber (R1) and a retard chamber (R2) of the phaser.

Claim 1 recites as follows:

1. A VCT mechanism for adjusting and maintaining an angular relationship between a cam shaft and a crank shaft or another shaft using a pressurized fluid, the VCT mechanism having a phaser using the pressurized fluid for adjusting and maintaining the angular relationship, the pressurized fluid flows from a fluid source to a fluid sink, the VCT mechanism comprising:

a locking pin being disposed to engage a **recess**, wherein the pressurized fluid is allowed to flow therein, to thereby disengage the locking pin from the **recess**;

a spool valve controlling the flow of the pressurized fluid for adjusting and maintaining the angular relationship, and **an extra land** disposed to control the timing of the pressurized fluid flowing from the fluid source toward **the recess** and from **the recess** toward the fluid sink; and

a set of independent passages being substantially independent of passages for maintaining fluid communication between at least one advance chamber and at least one retard chamber disposed to have fluid flowing therein, the set of passages including:

a first passage disposed to have fluid flowing therein, the first passage having a first end disposed to be in fluid communication with the fluid source and a second end;

a second passage disposed to have fluid flowing therein, the second passage having a first end disposed to be in fluid communication with the second end of the first passage, the second passage further having a second end in fluid communication with the **recess**; and

a third passage disposed to have fluid flowing therein, the third passage having a first end disposed to be in fluid communication with the first end of the second passage, the third passage further having a second end in fluid communication with the fluid sink.

Ogawa teaches a variable valve timing system with a relative rotation controlling mechanism allowing relative rotation of the housing member and the rotor member by an unlock operation through the supply of operation fluid, and restricting the relative rotation of the housing member and the rotor member at an intermediate angle phase between a most retarded angle phase and a most advanced angle phase by a lock operation through the discharge of the operation fluid. A hydraulic pressure circuit controls the supply and discharge of the operation fluid to the relative rotation controlling mechanism and also controls the supply and discharge of the operation fluid to the advanced angle chamber and the retarded angle chamber. The hydraulic pressure circuit is adapted to discharge the operation fluid from the advanced angle chamber, the retarded angle chamber **and the relative rotation controlling mechanism** when the combustion engine is started.

Ogawa does NOT teach a locking pin being disposed to engage a **recess**, wherein the pressurized fluid is allowed to flow therein, to thereby disengage the locking pin from the **recess**; and a set of independent passages being **substantially independent of passage** for maintaining fluid communication between at least one advance chamber and at least one retard chamber disposed to have fluid flowing therein, the set of passages including: a first passage disposed to have fluid flowing therein, the first passage having a first end disposed to be in fluid communication with the fluid source and a second end; a second passage disposed to have fluid flowing therein, the second passage having a first end disposed to be in fluid communication with the second end of the first passage, the second passage further having a second end in fluid communication with the **recess**; and a third passage disposed to have fluid flowing therein, the third passage having a first end disposed to be in fluid communication with the first end of the second passage, the third passage further having a second end in fluid communication with the fluid sink.

In other words, in Ogawa, lock pins such as lock pin 61 has bores 21j extending in the axial direction and connecting to, hence NOT independent of, the third passages 21c in communication with the advanced angle passage 11 at the radial inner end via the central inner bores and in communication with the advanced angle chamber R1 at the radial outer end. See Fig. 3 of Ogawa.

Furthermore, Ogawa does NOT teach or suggest a spool valve controlling the flow of the pressurized fluid for adjusting and maintaining the angular relationship, and **an extra land** disposed to control the timing of the pressurized fluid flowing from the fluid source toward **the recess** and from **the recess** toward the fluid sink. Applicant respectfully submits that the **land** (104a-104e) in Ogawa i.e. the five land portions 104a-104e are NOT the claimed **extra land** disposed to control the timing of the pressurized fluid flowing from the fluid source toward **the recess** and from **the recess** toward the fluid sink. At least for the reason that there are NO independent passages being substantially independent of passages for maintaining fluid communication between at least one advance chamber and at least one retard chamber disposed to have fluid flowing therein. For example, in Fig. 5 of Ogawa, the five land portions 104a-104e are only covering the openings of only three passages, i.e. the supply port 106, and connecting ports 101, 102. No independent passages being substantially independent of passage for maintaining fluid communication between at least one advance chamber and at least one retard chamber disposed to have fluid flowing therein is taught or suggested in Ogawa.

Therefore, it is respectfully suggested that the rejection of independent claim 1 as being anticipated by *Ogawa* is overcome. Dependent claims 2-3, and 5, being dependent upon and further limiting independent claim 1, should also be allowable for that reason, as well as for the additional recitations they contain. Reconsideration and withdrawal of the rejection are respectfully requested.

Regarding claim 6, ^Please cancel the same without prejudice.

In addition, because the present invention further provides a unique feature that combines the above two functions (see page 14 of the present application). This feature can be portrayed, for example, by referring back to Figs. 1a-1d. For instance when the spool valve (22) is moving out and crosses null the first command based on spool position is to move the VCT to the locked position. The second command occurs after the spool valve moves out further. So the sequence of events when the spool valve (22) is moving out is to relocate the VCT first and then locking pin (11) second. When the spool valve is moved "in", the staging of events is reversed. The first little movement of the spool valve first unlocks the VCT, even before the spool valve reaches null. After moving in past null the VCT then can move off the locked position. This is desirable because if you command the VCT to move before the locking pin is disengaged one tends to

wedge the locking pin in place and not be able to unlock the VCT via the actuating force against the pin. As can be seen, the present invention forestalls control strategies that need to give the VCT enough time to release before commanding it away from the locked position.

The feature described in the immediate above paragraph is not taught or suggest by Ogawa. In fact, Ogawa cannot achieve the instant feature because there is NO extra land taught or suggest therein. Therefore, the following set of method claims (claims 8-13) is amended to claim said feature. Note only independent claim 8 is listed below. Dependent claims 9-13 are listed in the claims section of the instant Office Action.

8. In a VCT mechanism for adjusting and maintaining an angular relationship between a cam shaft and a crank shaft or another shaft using a pressurized fluid, the VCT mechanism having a phaser using the pressurized fluid for adjusting and maintaining the angular relationship, the pressurized fluid flows from a fluid source to a fluid sink, a method comprising the steps of:

providing a locking pin being disposed to engage **a recess**, wherein the pressurized fluid is allowed to flow therein, to thereby disengage the locking pin from the **recess**;

providing a spool valve controlling the flow of the pressurized fluid for adjusting and maintaining the angular relationship, and **an extra land** disposed to control the timing of the pressurized fluid flowing from the fluid source toward **the recess** and from **the recess** toward the fluid sink;

providing a set of independent passages being substantially independent of passages for maintaining fluid communication between at least one advance chamber and at least one retard chamber disposed to have fluid flowing therein, the set of passages including:

a first passage disposed to have fluid flowing therein, the first passage having a first end disposed to be in fluid communication with the fluid source and a second end;

a second passage disposed to have fluid flowing therein, the second passage having a first end disposed to be in fluid communication with the second end of the first passage, the second passage further having a second end in fluid communication with the recess; and

a third passage disposed to have fluid flowing therein, the third passage having a first end disposed to be in fluid communication with the first end of the second passage, the third passage further having a second end in fluid communication with the fluid sink; and

based upon the positioning of the extra land, disengaging the lock pin immediately before unlocking the VCT mechanism for fluid communication between at least one advance chamber and at least one retard chamber. (emphasis added)

Rejection(s) under 35 U.S.C. §103

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (as applied to claim 1 above) in view of Gardner et al. (US Patent Application No. US 2003/0033998 A1).

Claim 4, being dependent claim, by virtue of its dependency, is deemed patentable. See traversing on claim 1.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ogawa (as applied to claim 1 above) in view of Linder (US Patent No. 5,386,807).

Claim 7, being dependent claim, by virtue of its dependency, is deemed patentable. See traversing on claim 1.

Reconsideration and withdrawal of the rejection are respectfully requested.

Conclusion

Applicant believes the claims, as amended, are patentable over the prior art, and that this case is now in condition for allowance of all claims therein. Such action is thus respectfully requested. If the Examiner disagrees, or believes for any other reason that direct contact with

Applicants' attorney would advance the prosecution of the case to finality, he is invited to telephone the undersigned at the number given below.

"Recognizing that Internet communications are not secured, I hereby authorize the PTO to communicate with me concerning any subject matter of this application by electronic mail. I understand that a copy of these communications will be made of record in the application file."

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